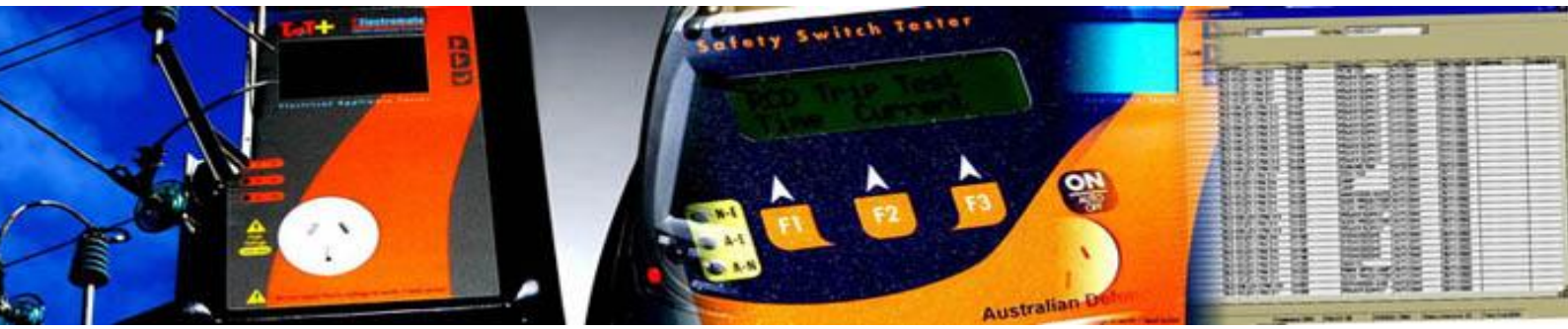

Wavecom Instruments
Portable Appliance Testers

Instruction Manual

Australian made to comply with the requirements of the Standard AS/NZS 3760

WAVECOM
INSTRUMENTS

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Accessories Supplied

(With the Range of TnT Portable Appliance Testers)

- Portable Appliance Tester Instruction Manual
- Manufacturers Calibration Certificate
- IEC Lead
- Earth Lead with Alligator Clip
- Soft Carry Case

Manufacturer Recommendations

(For the Range of TnT Portable Appliance Testers)

Calibration: The manufacturer recommends a routine calibration verification of readings for determining the accuracy of readings on a 12 Monthly basis.

Safety Warning

When using any electrical appliance SAFETY must always be observed. Testing appliances is no exception and in fact MORE care must be taken to ensure personal safety is met.

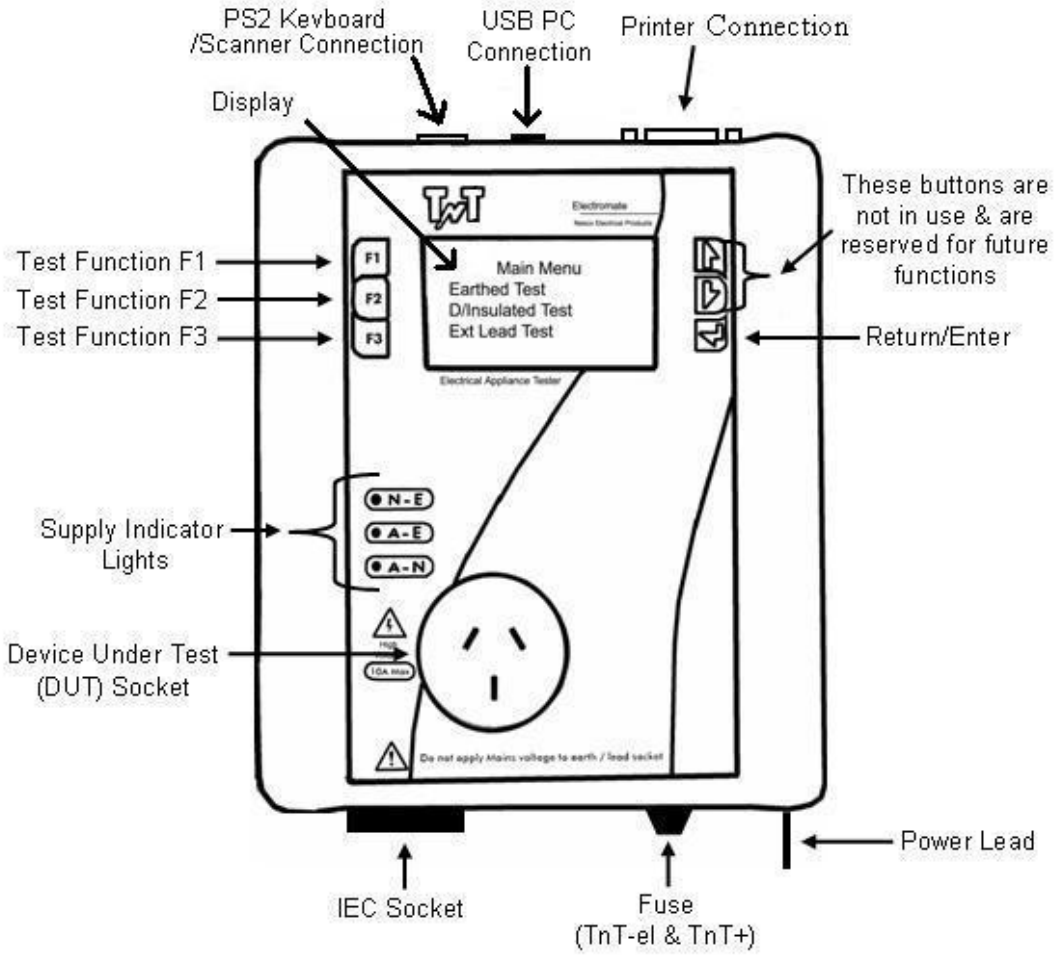
All though the TnT range of products has been designed to meet stringent requirements, no person can be completely protected against the consequences of the incorrect use of an electrical device.

We advise that appliance testing should be conducted by a competent and suitably trained person.

For maximum safety, always ensure that the following advice is followed;

- The equipment being tested is in good repair
- All user instructions are followed
- Double check power supply connections (LED's)
- Always use specific fuses and protection devices
- Do not use leads that require repair or are damaged
- If you are unsure, call a licensed Engineer/Electrician

TnT Portable Appliance Tester



Competent Person

To ensure that all electrical equipment or devices that are used to perform specific tasks, are inspected and tested and tagged correctly, regulations require that a competent person such as a Licensed Electrician be employed to perform the required tests.

A person competent to undertake Inspection and Testing of electrical equipment must therefore have:

- Knowledge and practical experience of electricity and its hazards.
- A clear understanding of precautions to avoid danger.
- The ability to recognise, at all times, whether it is safe for work to continue or not.
- The ability to carry out visual examinations of electrical equipment.
- The ability to distinguish between electrical equipment that is double insulated and equipment that is earthed as well as being able to identify the appropriate test for each type.
- The competency to carry out the Earthing Continuity, Insulation Resistance or Leakage Test and RCD tests on electrical equipment safely.
- The knowledge of how to use the relevant testing instruments, interpret and record the results for compliance with the Standard/Workplace requirements.
- The knowledge to be able to correctly recommend the frequency of testing required.

Due to the potential hazards of electrical testing all care must be taken.

Disclaimer

Limited Warranty

The Manufacturer warrants its products against defects in materials and workmanship for a period of 12 months from the date of purchase. During the warranty period, the manufacturer will repair (or at its option replace at no charge) the product that proves to be defective. This warranty does not apply if the product has been damaged by accident, abuse, misuse or miss-application or as a result of service or modification by anyone other than manufacturer of the TnT.

The TnT product range of devices or its' manufacturer IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, INCLUDING DAMAGE TO PROPERTY AND TO THE EXTENT PERMITTED BY LAW, DAMAGES FOR PERSONAL INJURY. The Distributors of this product cannot assume liability or responsibility for any loss or damage resulting from the use of this device.

The TnT manufacturer reserves the right to discontinue models, change specification, price or design, at any time without notice or obligation

Technical Information

Class 1 (Earthed Appliance) Construction

(Single basic insulated and protectively earth equipment)

This type of product design provides two safety barriers between all live conductors at dangerous voltages and the equipment user.

The provision of basic insulation between exposed metal parts and live parts is the first barrier to provide basic protection against electric shock.

The second safety barrier is by the connection of exposed (accessible) conductive (metal) parts to the protective earthing conductor (earth wire) in the fixed wiring of the device/Installation.

The protective earthing terminal of the equipment must be marked with the word "earth" or the symbol "E" or the symbol for Earth Terminal or Protective.

To perform this test a continuous earth loop must be made between the exposed conductive material (metal) and the TnT appliance tester. This is done by means of connecting the earth lead with the crocodile clip/probe attached to a GOOD earth point (paint & coatings will not provide effective connections) and the DUT (Device Under Test) plugged into the TnT appliance testers' DUT socket. The Maximum allowable limit is 1.0 (ohm).

Class 2 (Double Insulated) Construction

(Double insulated equipment)

This method of construction employs two safety barriers comprising two layers of insulation between dangerous voltages and the user of the equipment.

The first layer of insulation is formed around the live conductor and is termed 'the Functional Insulation'.

The second layer of insulation is termed 'the Supplementary Insulation'. In Class II equipment, protection against electric shock does not rely on basic insulation only, but has additional supplementary insulation such as double insulation or reinforced insulation provided, there being no reliance on precautions in the fixed wiring of installation.

Class II equipment is marked with the words "DOUBLE INSULATION" or the symbol

For double insulated under Safety Symbols:

Note 1 – Double Insulation is insulation comprising both basic and supplementary insulation.

Note 2 – Reinforced Insulation is a single insulation system with a degree of protection against electric shock, which is equivalent to double insulation.

Testing of Electrical Equipment

Many testing personnel have some reservations in testing sensitive, electronic equipment using a 500V DC insulation test. There is a perceived fear of causing internal damage from over voltage. With the introduction on the TnT Range of appliance testers, these concerns are alleviated.

The TnT Range of electrical portable appliance testers are safe to test electronic equipment as the tests are carried from Active-Neutral (shorted by a relay inside the tester) to Earth. No dangerous voltages pass through in this mode to the internal components of the DUT (Device Under Test). If these tests are done using an Insulation Tester only and the user tests Active to Neutral, this would be a cause of potential damage**, this is why the TnT product range is far safer to use.**

Some changes may be required in certain configurations where fitted surge protection devices (MOV's) in the DUT may cause a failed test result. Applying 500V in this these situations can cause the surge protection devices to trip, therefore conducting the applied voltage to earth, thus showing a failure of insulation. In these instances the test voltage should be changed to 250V then retest. If DUT still fails, check with the DUT Operators Manual or an electrician. *[for details see - 'Double Insulation Test' 250/500VDC to change test voltage].*

Under these circumstances, it would be difficult for any damage to occur to either the surge protection device or the DUT, as there is insufficient current generated by the TnT-el appliance tester.

Leakage Test:

If there are any doubts with insulation testing of the equipment, the standard (AS/NZ3760 since 2001) allows for an alternative test method. A Leakage Test can be performed instead. (The TnT-el & TnT+ models are designed to perform these tests).

NOTE: 10Amps MAXIMUM Resistive Load only (Standard TnT-el & TnT+ units).

A Leakage Test applies power to the Device Under Test (DUT) and measures the imbalance of leakage current from the DUT between the active and neutral conductors. The leakage is tested to the limits specified in the standard and a Pass/Fail result as well as a digital reading is provided to ensure that the user gains as much information as necessary.

Earth Continuity Test:

The TnT-el conducts earth continuity tests at Approx 200mA. Continuity tests at higher currents are not required and are not recommended on certain equipment as this can cause severe damage or premature failure to the DUT under test (as per AS/NZ3760).

3 Phase Testing:

3 Phase appliances can be tested by the TnT, TnT-el, TnT+ or the TnT-3PL appliance tester. This test is carried out by using the adaptor connection sockets. As the insulation tests are from Phase to Earth, only a 500V insulation test is required. These adaptors can be made by your electrician or purchased as an accessory. *[See 'Optional Accessories' for details - when ordering please state plug configuration of 3 phase plug. E.G. 5 pin Clipsal 56 series 20A].*

Please note: These 3 phase adaptors cannot test 3 phase extension leads or perform 3 phase leakage test.

CAUTION: Ensure that these adaptors are used only for appliance testing

To Change Test Voltage

To change the test voltages select the "change ins" from the options menu. Please refer to the special functions section of this manual.

Please Note:

- In earlier models the Return/Enter Key may need to be pressed 3 times to change Voltages.
- The TnT-el will automatically default to 500VDC when restarted.

Integrated Tests

Supply Mains Test

The Supply Mains Test checks the polarity and connectivity of the mains supply by LED's. This test is also a part of all the testing functions of this unit.

	If the N-E (red) light is on and you need to conduct load/leakage tests **DO NOT CONTINUE.** If you are carrying out standard Insulation and Earth Bond tests, it is generally safe to continue. This light will glow if a voltage difference lies between the neutral and the earth, or if no earth is connected to the TnT-el supply. (If working with a generator or inverter, this is most likely to occur and you may need to consult an electrician before proceeding).
	If both the A-E & A-N (green) lights are on but not the N-E (red), mains supply test is ok, continue to test.
	If both of the N-E (red) & A-E (green) lights are on, **consult an Electrician,** as there is a fault with the Mains Supply.

NCNT Test

(No Connection No Test)

The TnT appliance tester ensures that the Device Under Test (DUT) is plugged in and switched on. This test is also a part of all of the testing functions of this unit.

This test function ensures that the Device Under Test (DUT) is plugged into the TnT appliance tester and that it is switched on. If the DUT is not plugged in and the TnT appliance tester detects that no DUT is present, plug in the DUT to continue the test or confirm 'QUIT' to return to the main menu.

If for some reason the NCNT circuit does not detect the DUT but it is actually plugged in and turned on, the operator will need to override the TnT appliance tester to continue the test.

To do this press F3

With an emphasis in the standard AS/NZ3760 for carrying out the live testing the TnT appliance tester will indicate for you to check if the DUT is plugged in and switched on. If the DUT is not plugged in and/or recognised, it may require a live test therefore making it necessary for the operator to carry out a full functional Leakage Test (TnT-el & TnT+ appliance tester models only).

This function is to ensure that correct testing procedures are carried out in accordance with the Standard AS/NZ3760.

Note: When using 3-Phase adaptors the NCNT function will need to be over ridden by pressing the 'OK' key prior to the TnT appliance tester performing the assigned test. Some single Phase appliances controlled by contactors will require manual over ride also. In some instances holding the 'ON' button of the DUT will enable the NCNT function to work normally.

Visual Inspection (First Test)

Visual Inspection

THIS TEST IS TO OCCUR BEFORE ANY OTHER TEST IS CARRIED OUT USING ANY OF THE RANGE OF TnT APPLIANCE TESTERS

In regard to the Device Under Test (DUT), please ensure that;

- There is no damage or component defects to the accessories, plugs, outlet sockets or connectors (physical).
- There are no cracks &/or abrasions.
- There are no exposed inner cores or conductors (flexible) and that the supply cords are not twisted or distorted.
- Any Fuse / Over load protection components (if fitted) are checked.
- All labels, markings and warning indicators (of the maximum load to be connected to the device) are legible and intact.
- The insulation is not damaged in any way i.e. melted, cuts or abrasions. There are no iron filings in the insulation. There is no insulation tape on the lead.
- Any flexible cords and/or leads are effectively anchored (glands and grommets intact).
- All covers/guard are in place and secure as intended by the supplier/manufacturer.
- All safety devices and systems are in good working order. (ie. overload latches & buttons).
- No dust &/or dirt obstructs any exhausts or ventilation outlets.
- All controls are working properly and are secure and aligned.

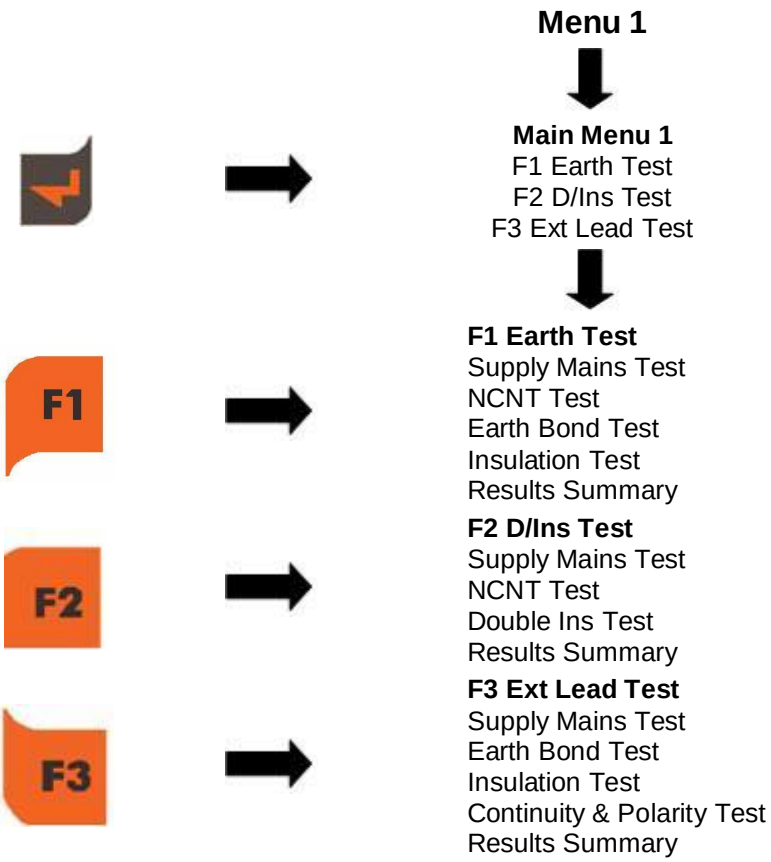
Important: If result is a fail

If a Device Under Test (DUT) fails any of the above, it should be deemed to have FAILED the Visual Test, and therefore no other tests need be performed. If this is the case the DUT should be tagged with a danger tag and removed from service. It is recommended by the manufacturer and distributor of this product that if a DUT has failed a test it SHOULD NOT BE RETURNED TO SERVICE. To do so would be considered unsafe.

TnT

TnT Test Function Flow Chart

Part No: WCM-TNT



Please Note: Menu 1 is common to all models (TnT, TnT-el & TnT+)

Earthed Appliance Test - F1

(For earthed appliances CLASS 1)

Please Note: A visual inspection test must be carried out before any others (refer to *First Test* Section)

The Earth Appliance Test completes the following sequences as part of its procedure:	
1. Integrated Supply Mains Test	Refer to *Integrated Test* section
2. Integrated NCNT Test	Refer to *Integrated Test* section
3. Earth Bond Test (@200mA): 200mA test current, pass level **less** than 1Ω	
4. Insulation Test (@ 250V or 500V): pass level **greater** than 1MΩ	

Please Note: 250V insulation testing applies to Class 1 appliances if selected (refer to *Technical Information* for details to change test voltage)

Procedure:

1. Complete a Visual Inspection on the DUI (Device Under Test). For details refer to the *First Test* section. If the DUT passed the Visual Inspection, continue with the following instructions, if not, refer to the *First Test* section.
2. Plug DUT into DUT socket.
3. Connect earth clip to any exposed metal on the DUT.
4. Press the F1 key and wait for results (ensure that DUT's mains switch is on)
5. Read and record results appropriately
6. Unplug DUT
7. Press the enter key to return to the main menu

If the result was a pass - Tag the DUT with the appropriate tag including "next test due" date and "return to service".

If the result was a fail - Tag the DUT wit a danger tag and remove the DUT from service.

In some situations if the DUT is labelled with “Surge Protection Fitted” or if it is electronic and fails, conduct a 250V-insulation test. Should it still fail, remove it from service. (refer to the *Technical Information* section to change test voltage).

Please Note: Ensure that the DUT to be tested is isolates from any ground loop.

Double Insulation Test - F2

(For double insulated appliances CLASS 2)

Please Note: A visual inspection test must be carried out before any others (refer to *First Test* Section)

The Double Insulation Test completes the following test sequences as part of its procedure	
1. Integrated Supply Mains Test	Refer to *Integrated Test* section
2. Integrated NCNT Test	Refer to *Integrated Test* section
3. Double Insulation Test (@250V or 500V): pass level **greater** than 1MΩ	

Procedure:

1. Complete a Visual Inspection on the DUI (Device Under Test). For details refer to the *First Test* section. If the DUT passed the Visual Inspection, continue with the following instructions, if not, refer to the *First Test* section.
2. Plug DUT into DUT socket.
3. Connect earth clip to any exposed metal on the DUT (if any, or device can be wrapped in foil or use metal mesh braid, Part No: TnT-ES 500)
4. Press the F2 key and wait for results (ensure that DUT's mains switch is on)

5. Read and record results appropriately
6. Unplug DUT
7. Press the enter key to return to the main menu

If the result was a pass - Tag the DUT with the appropriate tag including "next test due" date and "return to service".

If the result was a fail - Tag the DUT wit a danger tag and remove the DUT from service.

In some situations if the DUT is labelled with “Surge Protection Fitted” or if it is electronic and fails, conduct a 250V-insulation test. Should it still fail, remove it from service. (refer to the *Technical Information* section to change test voltage).

Ext Lead Test - F3

(For extension lead/power board & IEC lead)

Please Note: A visual inspection test must be carried out before any others (refer to *First Test* Section)

The Ext. Lead TEST completes the following sequence as part of its comprehensive testing procedure:	
1. Integrated Supply Mains Test	Refer to *Integrated Test* section
2. Earth Bond Test (@200mA): 200mA test current, pass level **less** than 1Ω	
3. Insulation Test (@ 250V or 500V): pass level **greater** than 1MΩ	
4. Continuity and Polarity Test 240VAC @ 2mA Checks continuity & polarity of leads	

Procedure:

1. Complete a Visual Inspection on the DUI (Device Under Test). For details refer to the *First Test* section. If the DUT passed the Visual Inspection, continue with the following instructions, if not, refer to the *First Test* section.
2. Plug in IEC adaptor lead into IEC socket (remove earth lead if inserted - please read note below).
3. Plug male end of extension lead or power board in to TnT tester DUT socket.
4. Plug IEC adaptor lead into extension lead/power board socket.
5. Press the F3 key and wait for results
6. Read and record results appropriately
7. Unplug extension lead/power board
8. Press the enter key to return to the main menu

If the result was a pass - Tag the DUT with the appropriate tag including "next test due" date and "return to service".

If the result was a fail - Tag the DUT wit a danger tag and remove the DUT from service.

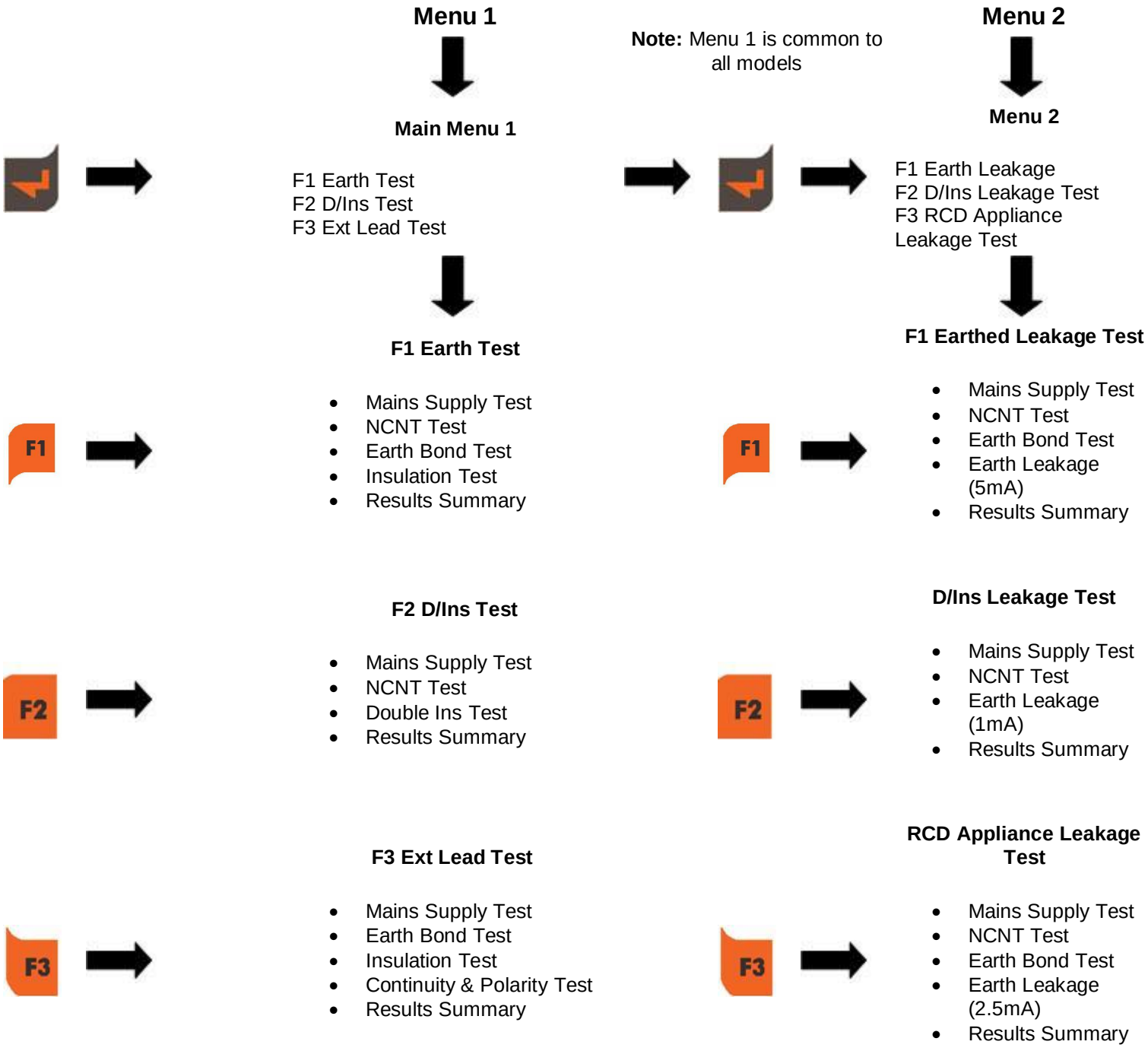
Please Note:

- Extension leads should always be uncoiled before using or testing.
- Please ensure that the IEC Adaptor & the IEC socket are inserted firmly or it may result in a continuity/polarity fail.

TnT-el

Part No: WCM-TNT-EL

TnT-el Test Function Flow Chart



Tests Common To All Models - Menu 1

Earthed Appliance Test (refer to *TnT*)

Double Insulation Test (refer to *TnT*)

Ext Lead Test (refer to *TnT*)

Leakage Test

The Leakage Test is an alternate method to perform insulation resistance tests. Leakage testing is a major function of the TnT-el & TnT+ models

Please Note: A visual inspection test must be carried out before any others (refer to *First Test* Section)

This test determines errors of leakage not otherwise detected in a normal insulation test. If there are any doubts with insulation testing of the equipment, the Standard (AS/NZS 3760 since 2001) allows for a leakage test to be carried out **instead.** The TnT-el & TnT+ appliance testers have been designed to perform these tests. The Leakage Test applies power to the Device Under Test (DUT) and measures any imbalance or leakage current. The leakage is tested to the limits of the class types specified in the Standard AS/NZS 3760 ie. Class 1 = > 5mA as Fail.

The Limit of imbalance measured on the TnT-el appliance tester will read well in excess of the limits set in mA. However, should the supply circuit be protected by an RCD this device will trip any where between 10 to 30mA and trip the mains supply switch OFF.

Procedure:

1. Complete a Visual Inspection on the DUI (Device Under Test). For details refer to the *First Test* section. If the DUT passed the Visual Inspection, continue with the following instructions, if not, refer to the *First Test* section.
2. Press the return key to view menu 2.
3. Press a function key (as follows) to start the test/s. Press either F1, F2 or F3 depending on the type of DUT you are testing). **F1** = Earth Leakage, limit set to MAX then 5mA fail. **F2** = D/insulated leakage and ext leads, limit set to MAX then 2.5mA fail. **F3** = RCD leakage.

   CONFIRM SAFE TO CONTINUE? OK/QUIT. IF OK, DEVICE WILL TURN ON. ENSURE SAFE OPERATION!

4. Results are displayed, read and record appropriately.
5. Unplug DUT.
6. Press Enter until you return to the main menu.

If the result was a pass - Tag the DUT with the appropriate tag including "next test due" date and "return to service".

If the result was a fail - Tag the DUT wit a danger tag and remove the DUT from service.

Please Note: Test will pass even if DUT is not plugged in.

The Leakage Test allows the user to operate the DUT in normal operation conditions and measure its Operating Leakage current. The displayed parameter is mA. The mA Display Range 0.0 to 22.0 mA.

A predefined value for individual class types is programmed into your TnT-el & TnT+ appliance testers. These limits are set according to the AS/NZ3760. Should these values change in future it can be simply altered in firmware. A Pass / Fail will also be displayed at the end of the test.

The run time period can be adjusted (by 5sec increments). The value can be changed by selecting the leakage test time in the options menu. See the special functions section of the manual for more details. The factory default setting is 20sec. The value for the leakage runtime is also used for the power test (plus models only).

Before operating ensure the equipment is firmly secured to eliminate the possibility of causing injury or damage. This function turns the DUT on, any rotating devices have clearance from body or object. Appliances may jump off benches or cause serious damage if not secured properly.

To stop operation press the return/enter key at any time. The unit will power down after 20 seconds as factory default

Caution: This test turns the Device Under Test (DUT) ON. The power / leakage test can handle up to 10 Amp (Resistive) Load MAX. Exceeding this value will blow the external M205 ceramic fuse. Care should be taken when testing inductive loads (ie AC motors) with large start up currents. To stop operation press and hold the Return/Enter key at any time. The unit will power down after 20 seconds as default.

If 10A HBC fuse is blown the appliance will not operate in Power test or Leakage test modes. Replace fuse only with M20 10A HBC fuses. Any other fuse voids warranty and manufacturers design. Do not open TnT case as there are no serviceable parts inside.

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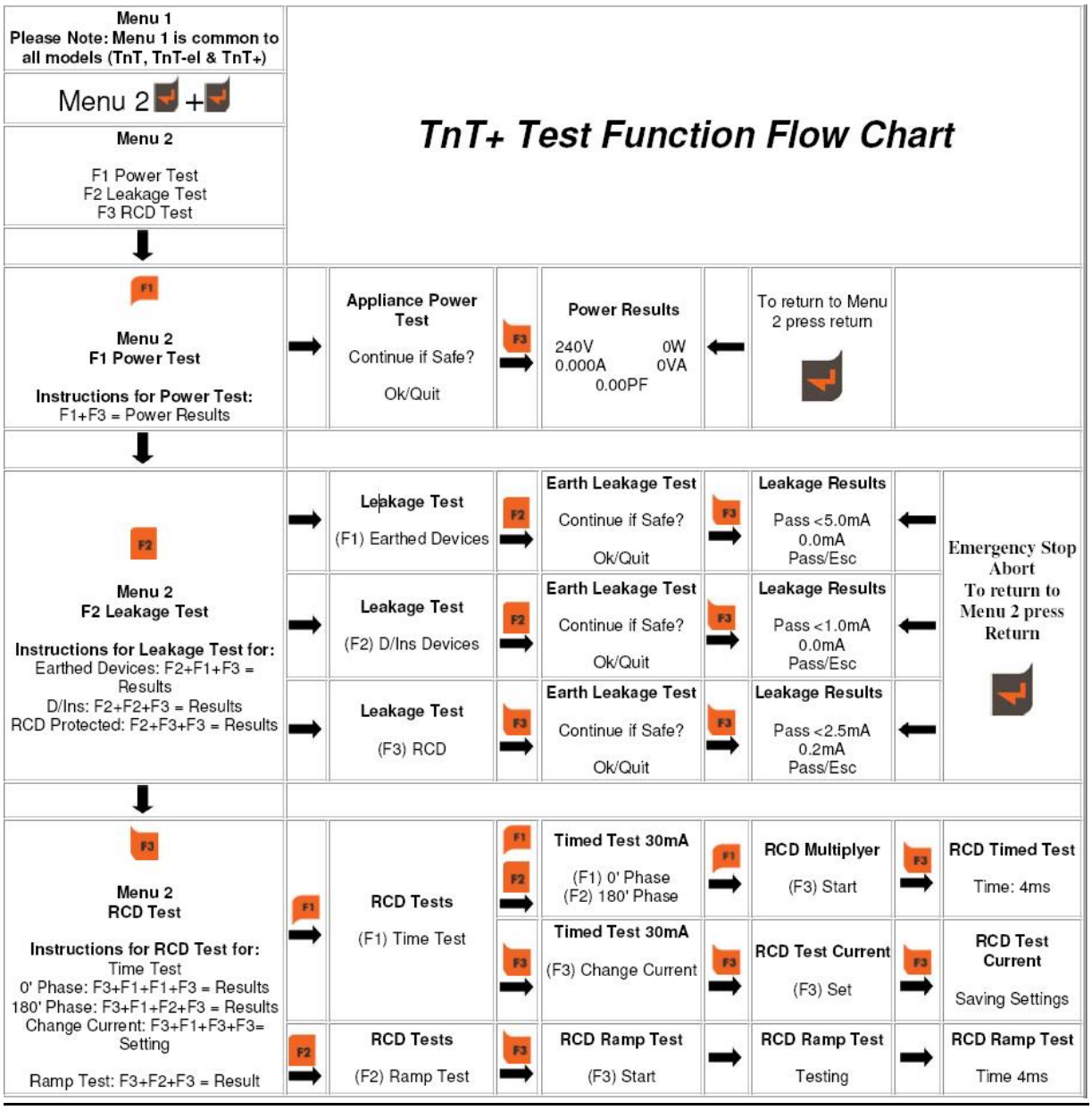
TnT+

Part No: WCM-TNT+

TnT+ Test Function Flow Chart



Tests Common To All Models - Menu 1

Earthed Appliance Test (refer to *TnT*)

Double Insulation Test (refer to *TnT*)

Ext Lead Test (refer to *TnT*)

Power Test - Menu 2

The Power Test is for the purposes of monitoring and performance testing the DUT up to the current value 10Amps.

Please Note: A visual inspection test must be carried out before any others (refer to *First Test* Section)

The Power TEST completes the following sequence as part of its comprehensive testing procedure:	
1. Integrated Supply Mains Test	Refer to *Integrated Test* section
2. Power Test	

Procedure:

1. Complete a Visual Inspection on the DUI (Device Under Test). For details refer to the *First Test* section. If the DUT passed the Visual Inspection, continue with the following instructions, if not, refer to the *First Test* section.
2. Plug male end of DUT into TnT Appliance socket
3. Press F1 to start the power test
4. If the appliance is safe to test press F3 on safety warning message. The DUT will power on.
5. Read and record results appropriately
6. Once the appliance has powered down and the test is complete. Unplug the DUT
7. Press Enter to return to the main menu

This test is Ideal for service agents and electricians. The User can plug in the appliance and turn it on with real time measurements displayed on the display. This is useful when testing a DUT with a compliance/name plate on it. The operator can compare the name plate details of operating voltage, operating current, and power factor etc. should the appliance exceed the said values on the name plate it could be deemed faulty and require service.

Please note: Because the power test is not required in the electrical testing standards there is no pass / fail value in the TnT+. It is up to the user to determine if the item is a pass or a fail based on the compliance/name plate on the DUT. If the test is performed VIA WinPATS a pass fail value can be set during the test.

If the result was a pass - Tag the DUT with the appropriate tag including "next test due" date and "return to service".

If the result was a fail - Tag the DUT wit a danger tag and remove the DUT from service.

To select the second menu, press and release the Return/Enter Button.

This menu will display 3 functions:

- Power Test
- Leakage Test
- RCD Test

The Power Test allows the user to turn the appliance on and measure its performance as a digital wattmeter. Displayed parameters are:

- Volts AC
- Current
- Volt Amp
- Power Factor
- Watts

Note: Before operating, ensure the equipment firmly secured and is free from any possibility of causing injury or damage. This function turns the appliance on any, rotating devices have clearance from body or object. Appliances will jump of benches if not secured properly.|

Caution: This test turns the Device Under Test (DUT) ON. The power / leakage test can handle up to 10 Amp (Resistive) Load MAX. Exceeding this value will blow the external M205 ceramic fuse. Care should be taken when testing inductive loads (ie AC motors) with large start up currents. To stop operation press and hold the Return/Enter key at any time. The unit will power down after 20 seconds as default.

If 10A HBC fuse is blown the appliance will not operate in Power test or Leakage test modes. Replace fuse only with M20 10A HBC fuses. Any other fuse voids warranty and manufacturers design. Do not open TnT case as there are no serviceable parts inside.

Leakage Test

Refer to *TnT-el*

RCD Test - Menu 2

Please Note: Where ANY RCD testing, is to be carried out any circuit that is protected by an RCD in the main switchboard (upstream), it's most likely to trip this upstream RCD. When performing RCD trip time or trip current tests on any down stream (portable) RCD devices, the RCD in the switchboard will trip faster. This is due to increased upstream levels of leakage current from the additional circuits and devices connected to it. The fixed RCD's can also have better connectivity, sensitivity and mechanical mechanisms.

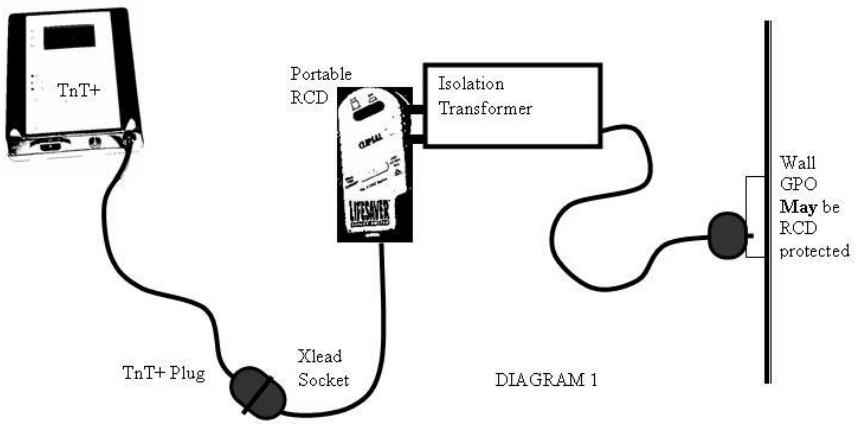
To avoid tripping large areas in the work place monitored by the switchboard RCD it is suggested that an RCD isolation transformer be used. (TnT-ISOT) These are designed specifically for the purposes of field RCD tripping.

DO NOT use these Transformers for any other purpose.

Ratings 240VAC in 240VAC Out @ 30VA Fuse protected Primary winding 500mA

To perform RCD tests the TnT+ supply lead needs to be plugged in to the RCD device to be trip tested. For tripping switchboard mounted (Fixed) RCDs Plug TnT+ into GPO marked RCD protected or if known to be protected circuit. (Diagram 2)

If testing portable RCD devices on power boards or extension leads plug TnT+ into power board or lead (recommend Isolation transformer) Diagram 1



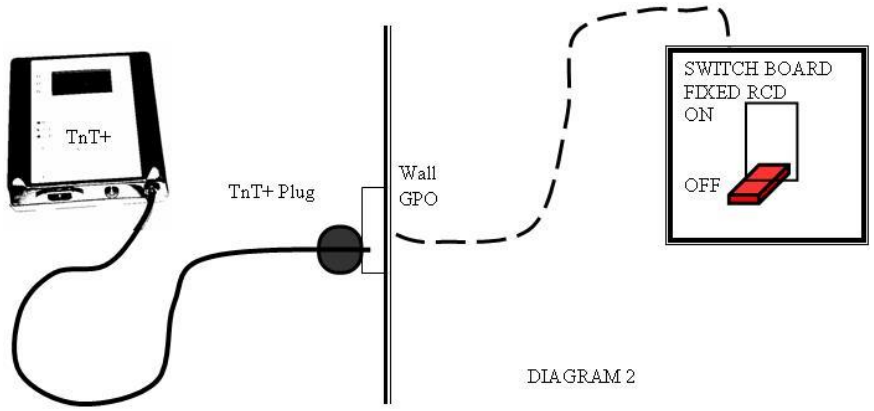


DIAGRAM 2

To select the second menu, press and release the Return/Enter button.

This menu will display 3 functions:

- Power Test
- Leakage Test
- RCD Test

To enter the RCD menu press and release the F3 button.

RCD Tests
Time Test
Ramp Test
Exit

Press F1 to select the time test.

Trip Time Testing: This principal is designed to trip RCD devices at a fixed current and to determine the trip time of the RCD device.

This function is factory set to 30mA for fast testing the user can set the current to X0.5, X1.0, X 5 using the RCD Multiplier.

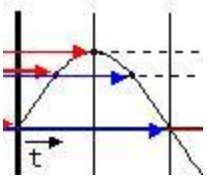
I.E. 30mA X 0.5 =15mA

30mA X 1.0 = 30mA (this also is effective on any set test current of the RCD tester from 5mA to max 500mA output.)

30mA X 5.0 = 150mA

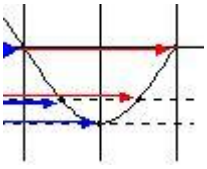
These tests should result in no-trip, trip & fast trip times respectively.

F1 - 0 deg



This is the positive half of the mains supply cycle. (50HZ Aust/NZ). Press F1 – The preset mA test current will then be used in the following test and begin the trip test from the positive half of the sine wave

F2 - 180 deg



This is the negative half of the mains cycle, (50HZ Aus/NZ). Press F2 - The preset mA test will then be used in the following test and begin the trip test in the negative half of the sine wave

Performing a Time Test:

The displayed trip time is in milliseconds. This is the time taken for the RCD device to trip once the injected fault current has been applied. The TnT+ injects a true fault current value using a real time compensation calculation of the actual voltage at the time of test. Hence delivering a true and accurate trip current no compensation of voltage fluctuations corrections required. Voltage range 200 – 265V ac

Timed Test 30mA 0 Deg. 180 Deg Settings

RCD Test Options:

F3 – Change to select test options: This allows the user to set the trip current level, 5mA to 500mA. The RCD type can also be select here depending on if the unit is a type I or type II see the next section for explanation. From the options menu press F2 to change the current level and F3 to change the RCD type.

Options: Set Current Set RCD Type

Adjusting the current level:

The TnT+ displays and maintains the last, set trip current value.

If the user wishes to change the value of the trip current the following steps enable the changes.

Press and release F2 from the options section to display test current.

Up - This button raises the trip current in 1mA increments to 500mA. Hold the button and the value will scroll faster the longer depressed. Once 500mA limit is reached the value will then loop over and start again from 0mA

Down - This button decreases the trip current in 5mA increments. Hold the button and the value will scroll faster the longer depressed. Once 0mA limit is reached the value will then loop over and start again from 500mA.

Set - This button sets the selected current for the next trip time test. The TnT+ will then return to the current trip time test screen.

Changing the RCD type:

Depending on the RCD, the RCD type needs to be selected from the options menu. These options change the pass / fail values when performing RCD tests. Please make sure that you have the correct RCD type selected. The RCD types are:

Type I:
Has a trip time of < 40mS and a trip current of < 10mA. These types of RCD's are mainly used on sites containing medical equipment. These types of RCD's must be compliant with AS3551.

Type II:
Has a trip time of < 300mS and a trip current of < 30mA. Unless specified on the RCD device nearly all RCD will be this type. The this is the default setting on new units.

Selects type I and saves to memory

Selects type II and saves to memory

RCD Timed Test (continued):

Press the F1 key to select the 0 deg test and the F2 key to select the 180 deg test.

Use the F1/F2 keys to scroll through the multipliers X0.5 X1.0 X5.0 of the set current.

Maximum output current = 500mA. I.E if set test current were 100mA then 100 X 5.0 =500mA.

If set test current = 200mA then maximum out put 5 x 200mA =1A is out of range. Unit will not deliver this output current and display on Screen “OUT of RANGE”.

Press F3 to start test. TnT+ will display results for 5 seconds after mains supply is tripped. If the power is not reset by the time the unit loses power then the result will be displayed on power on.

Caution: Pressing F3 at this point will cause tripping if RCD fitted to circuit

TRIP CURRENT TEST. This testing principal is designed to trip RCD devices using a ramping up current value, to determine the trip current of the RCD device. This useful test allows the user to determine circuit leakage load/pre-loading of RCD circuit. This can assist in determining nuisance tripping issues or determining RCD performance if suspected faulty or inconsistent in performance. The TnT+ has a nominal leakage current of 2mA, which should be added to the result of test. **E,G.** if RCD tripped at 22mA + 2mA(TnT+)=24mA trip current.

RCD Trip Current. Press F2 to show the Trip current screen.

RCD Ramp Test:
Set RCD Type
Start Exit

Caution: Pressing F3 at the RCD ramp test screen will cause tripping if RCD fitted to circuit. F2 can be pressed to change the RCD type at this point. See "Changing the RCD type" for details.

The Trip Current Test will ramp the mA current up until the RCD breaker trips. Current range 2.55 - 500mA. This test can go for up to 10 sec to scroll through full range if RCD faulty or not fitted. Repeated testing in this mode will cause heating of TnT+. Should over heating occur the internal temperature sensor will cause display to indicate “over temp allow to cool” This requires the TnT+ device to be best left unplugged for several minutes allowing unit to cool.

TnT+ will display results for 5 seconds after mains supply is tripped. If the power is not reset by the time the unit loses power then the result will be displayed on power on.

Caution: Continuous ramp current testing will cause unit to over heat

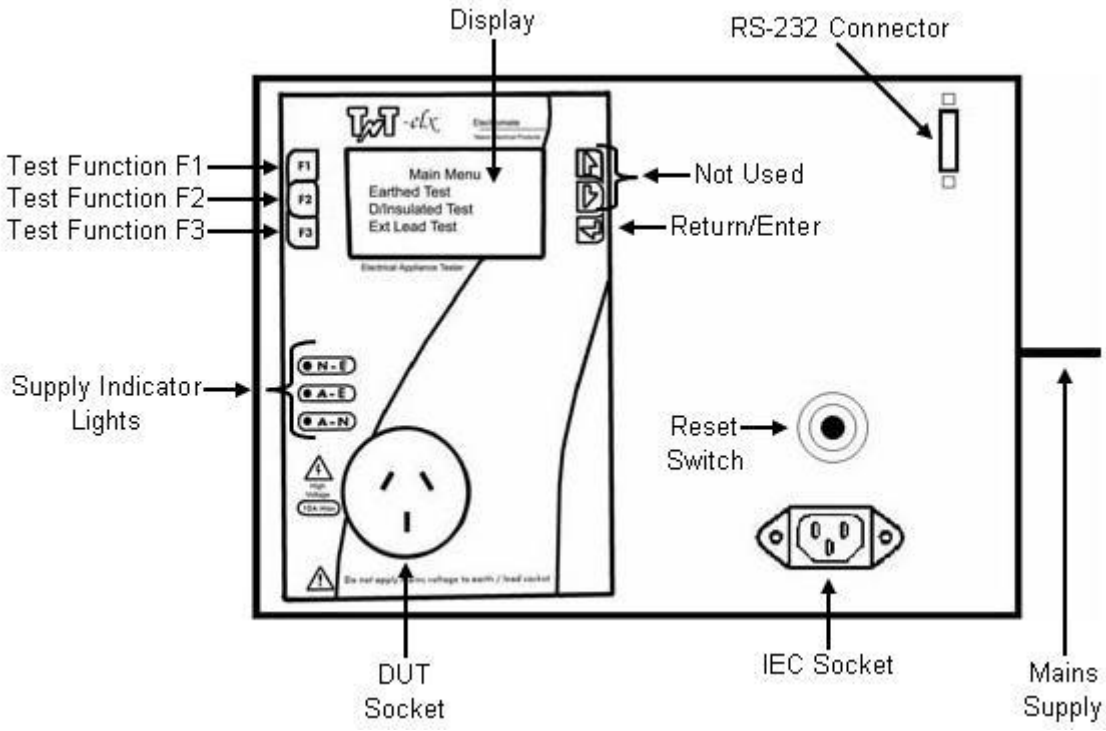
TnT-elx

Part No: WCM-TNT-elx-15 (15A Plug)
Part No: WCM-TNT-elx-20 (20A Plug)

Before continuing reading this manual it is expected that you have the previous sections. This includes reading all safety procedures and functionality of the TnT. Certain functions of the TnT-elx including F keys, display LED's & leads are explained in previous chapters.

The TnT-elx has the same functioning as a TnT-el, and has the additional feature of allowing the user to test earth leakage loads up to 20 Amps.

TnT-elx Diagram



TnT-elx Test Function Flow Chart

The TnT-elx has the same test function pattern as the TnT-el. Refer to the TnT-el Test Function Flow Chart for more information

Tests Common To All Models

Earthed Appliance Test (refer to *TnT*)

Double Insulation Test (refer to *TnT*)

Ext Lead Test (refer to *TnT*)

The TnT-elx is capable of performing Leakage Tests. Information regarding this can be found in *TnT-el*

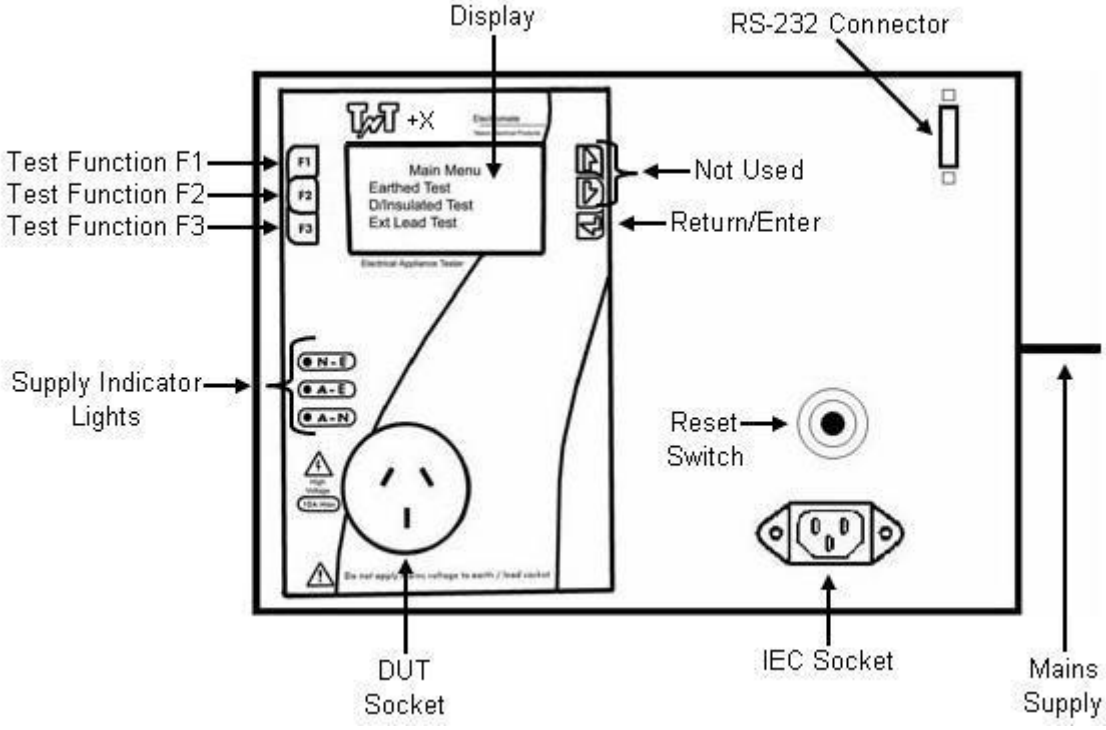
TnT+X

Part No: WCM-TNT+X-15 (15A Plug)
Part No: WCM-TNT+X-20 (20A Plug)

Before continuing reading this manual it is expected that you have the previous sections. This includes reading all safety procedures and functionality of the TnT. Certain functions of the TnT+X including F keys, display LEDS & leads are explained in previous chapters.

The TnT+X has the same functioning as a TnT+, and has the additional feature of allowing the user to test earth leakage loads up to 20 Amps.

TnT+X Diagram



TnT+X Function Flow Chart

The TnT+X has the same test function pattern as the TnT+X. Refer to the TnT+ Function Flow Chart for more information.

Tests Common To All Models

Earthed Appliance Test (refer to *TnT*)

Double Insulation Test (refer to *TnT*)

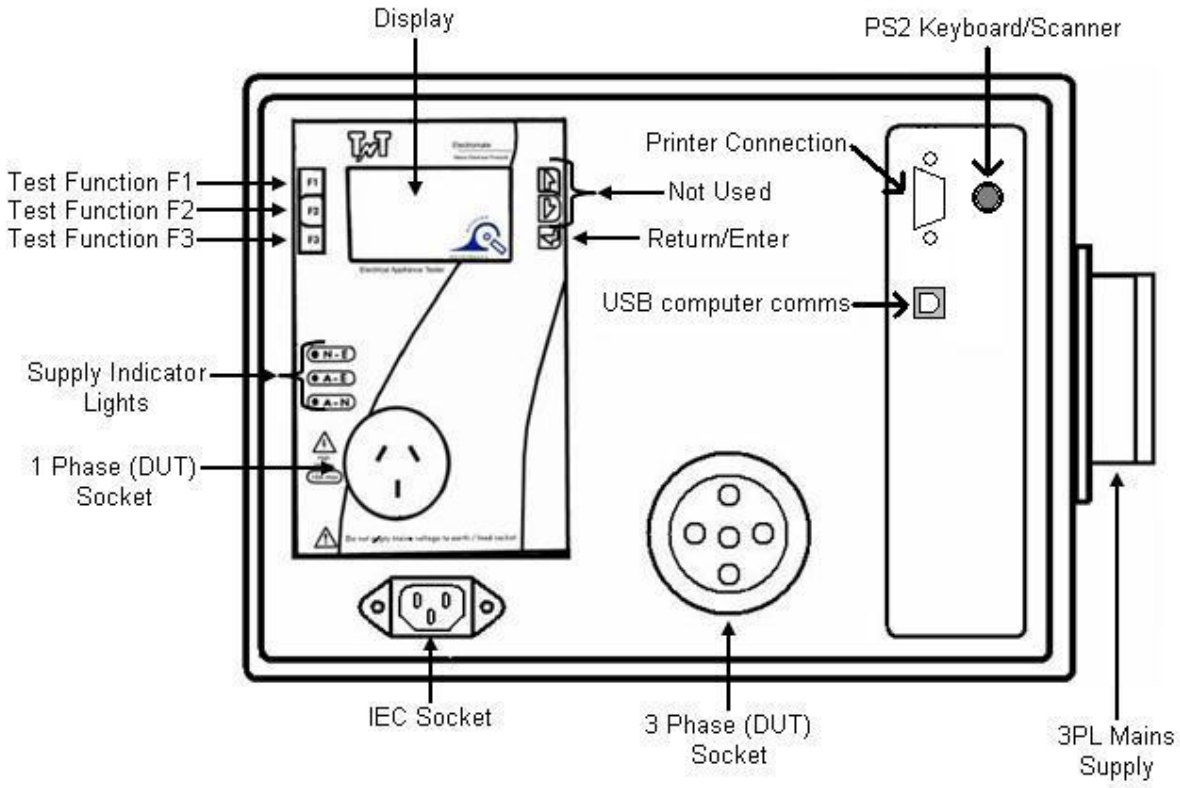
Ext Lead Test (refer to *TnT*)
The TnT+X is capable of performing Leakage, Power and RCD tests. Information regarding Leakage Tests can be found in TnT-el, and information regarding RCD and Power tests can be found in TnT+.

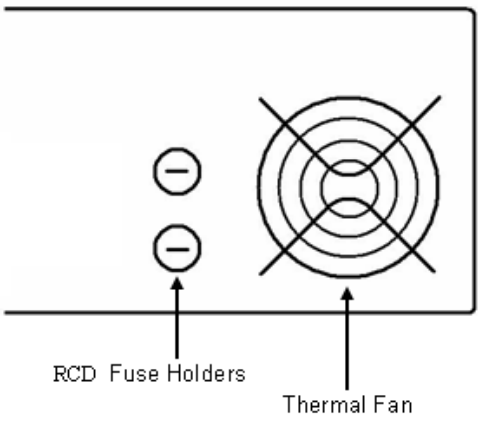
3PL

Part No: WCM-TNT-3PL

Before continuing reading this manual it is expected that you have read the previous sections. This includes reading all safety procedures and functionality of the TnT. Certain functions of the 3PL including F keys, display LED's & leads are explained in previous chapters.

3PL Diagram





Power Up Checking

When the 3PL is turned on it will determine the type power source. This is either:

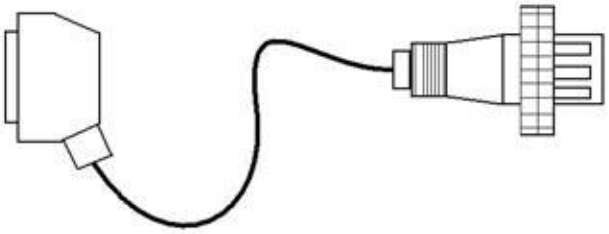
- 1 Phase 3 Wire
- 3 Phase 4 Wire (No Neutral wire)
- 3 Phase 5 Wire (With Neutral wire)

If the power source is 3 phase the tester will do an additional phase rotation test. The test will indicate that the phase rotation is correct or incorrect. The 3PL will determine the power source by the plug attached to the mains power supply in 3PL front diagram.

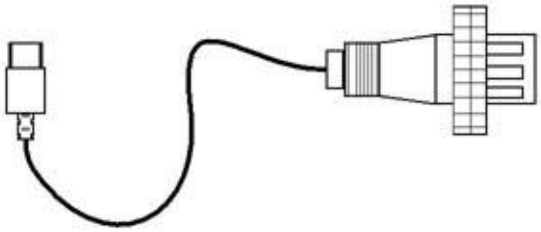
3PL Cables

Single Phase Power Supply Cord:

3 Phase Power Supply Cord (4 and 5 pin types):



3 Phase Extension Lead Testing Cord:



Warning: Do not connect the 3 phase extension cable to a 3 phase wall outlet. Damage may result. This cable should only be used for testing extension leads. Similar testing procedure are done with this cable as described in Ext Lead Test (refer to *TnT*).

Menu System

The menu system is divided into 3 menus. Menu 1 & 2 are related to single phase testing. Menu 3 is related to 3 phase testing. When performing 1 phase test only the 1 phase DUT socket will be used. In menu 3 only the 3 phase DUT socket will be used. The 3PL has an internal contactor that switches between the single and 3 phase outlet. You must select the correct type of test to select the correct outlet. For example if a DUT is plugged into the single phase outlet and a 3 phase test is chosen then a NCNT message will appear. This is because the 3PL has selected the 3 phase outlet and is not detecting any appliance.

Certain test will be available depending on what power source the 3PL is plugged into. The 3 different test modes are:

1 Phase 3 Wire: All tests except 3 Phase leakage test.
3 Phase 4 Wire: All test except single phase power test.
3 Phase 5 Wire:-All tests are available.

These modes are displayed when the 3PL is first powered on. If a test is not available based on the type of power input then a message will be displayed on the screen.

Other 3PL Features:

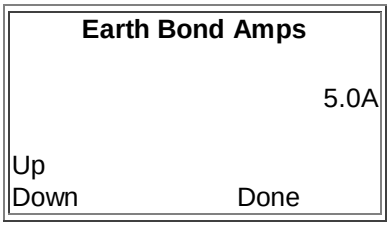
- The 3PL contains two fuse holders show in side view diagram. These are used to protect the RCD circuitry of the 3PL. Only replace these fuses with M205 1A ceramic slow blow fuses. Under normal condition these fuse should never have to be replaced.
- The 3PL uses a thermal fan located on the side of the unit. This operates whenever an earthbond test is performed or if the unit internal temperature is too hot.
- The 3PL contains an internal thermostat which cuts the power to the unit at 75C. This may be triggered on hot days when performing many earthbond tests. If the 3PL does not power up, unplug the unit and wait 10-20 minutes to cool down.
- An RS-232 port is located in the console of the lid. This is for connecting to the Zebra printer VIA a serial cable.
- PS2 keyboard connect is provided to connect a scanner and keyboard.
- A USB port that connects to the PC for uploading, downloading records and general testing.
- 3PL allows up to 1000VDC insulation tests. The default is always 500VDC. If the voltage needs to be changed then please read the change ins in the TnT options section.

3PL Earth Bond Current Selection

New 3PL models:
In 3PL models there is an additional option called E/bond amps set in TnT options. See the TnT options on how to access this.

Old 3PL models:

- Select Menu 1
- Press the Return/Enter key
- Press the F1 key



- To adjust the current, use the F2 & F3 keys
- Press the Return/Enter key to choose the selected current

3PL RCD Trip Phase Selection Menu

To change the RCD trip phase:

Note: The RCD phase selection menu will only appear when the 3PL is in 3 phase mode

- From Menu 2 select the RCD menu
- Press the F3 key to choose phase menu
- Use the F keys to choose the phase

Tests Common to 3PL & TnT+ Models

Menu 1

Earthed Appliance Test (refer to *TnT*)

Double Insulation Test (refer to *TnT*)

Ext Lead Test (refer to *TnT*)

Menu 2

Power Test (refer to *TnT+*)

Earth Leakage Test (refer to *TnT-el*)

RCD Test (refer to *TnT+*)

TnT Memory Operation

Introduction

The TnT Memory model has inbuilt flash memory and real time clock. This gives the ability to store up to 5000 records, which can include items from 16 different sites and 6 different users. This will help to increase the efficiency and pace of testing. The TnT memory unit has two operating modes:

- Standard TnT tester (Non-memory)
- Test and Tag (memory)

The TnT mode is determined keypad on power on. If there is no keypad detected then the TnT will load the main menu screen and function as a standard unit. If the keypad is present then the new barcode screen will be loaded.

Powering on the Tester

When the tester is powered on the scanner will beep a few times indicating the scanner is also powered. If no beep is heard check the PS2 connections from the tester.

If the TnT tester gets stuck on the logo screen please check the connectivity of the keypad / scanner cable. The TnT unit will not work if only the scanner is plugged in. If you are using the scanner you need the keypad plugged in as well. Not having a scanner and just the keypad works too.

Initially the printer's status light will be orange. After about 5-10 seconds it will change to green. The tester will not print unless the printers light is solid green. A flashing red status light can indicate a media or general printer fault.

Adding New Equipment

The following must be done before testing:

- Create a site or use and existing site.
- Create a user name to under the users list.
- If auto generate number are used the initial number must be set correctly.
- If you are adding equipment to an existing site please make sure that the correct site is displayed. If the wrong site is displayed the equipment will be assigned to the wrong site.

When the testers memory has been erased it will look like the following screen.

Screen	Instruction
< F1 Select Site New Barcode 0000000 5000	The initial screen in memory mode operation. A site and user must be entered before testing can be done. When using the TnT for the first time, < F1 Select Site will be flashing in the top region of the screen.

Adding a Site

Screen	Instruction
New Barcode 0000000 5000	From the initial screen, press F1. Don't hold the F key, this will select a different function.
Sites 1 - 3	The TnT can hold up to 16 sites. To scroll through the sites, press enter. 3 sites will be shown on each screen. Each site corresponds to an "F" key, for example Site 1 = F1. To edit a site, **hold** the corresponding "F" key for 2 seconds. If the Site has a * symbol next to the name then the site name cannot be altered. This site was uploaded from WinPATS and needs to remain the same.
Edit Site *X* ALP	Using the keypad, enter the name of the site. The Keypad operates in 3 modes, Alpha, Numeric and Predictive. When an editable screen is entered, there will be an ALP, NUM or PRE in the top right hand corner of the screen. If you are using a full size half size keyboard then the 3 modes don't apply. Leave the text on ALP mode. Once the details have been typed in press enter to return. *Note:* Predictive mode will only work if a dictionary has been uploaded from WinPATS MX. Once a site has been entered, press enter.
Sites 1 - 3 Site 1 Site 2 Site 3	Once a site has been entered, the 'F' buttons are used to select the site; for example to select site 1, F1 would be pressed.
Site 1 New Barcode 0000000 5000	Once a site has been selected, the TnT will return to the initial screen and the site that was selected will be shown in the top left hand corner of the screen.

Adding a User

Screen	Instruction
New Barcode 0000000 5000	From the initial screen, press F2. Don't hold the F key, this will select a different function.
Users 1 - 3	The TnT can hold up to 6 users. To scroll through the users, press enter. 3 sites will be shown on each screen. Each site corresponds to an "F" key, for example User 1 = F1. To edit a user, hold the corresponding "F" key for 2 seconds.

Edit User *X* ALP	Entering a user is the same process as entering a site, please refer to the Adding a Site steps above, *Note:* The user name will not appear on the initial screen once selected.
Users 1 - 3 User 1 User 2 User 3	Once a user has been entered, the 'F' buttons are used to select the user; for example to select user 1, F1 would be pressed.

Auto Generate Barcode Function

If required the auto generate barcode number can be set before testing. The auto generate is always displayed in the bottom left hand corner of the new barcode screen.

Screen	Instruction
Site x New Barcode 0000000 5000	The TnT incorporates an auto generate barcode function which allows barcodes to be generated sequentially after a barcode has been specified, for example: the specified barcode is 1000 so the next barcode to be generated will be 1001, 1002, 1003 etc. This can be accessed by holding F3 for 2 seconds on the Barcode Entry screen.
Barcode Length: Up 7 Digits Down Esc Set	Once the auto generate menu has been accessed, the user can specify how many digits they want in the barcode. The auto generate function allows a minimum of 2 and a maximum of 7 digits in the barcode to be generated. To increase the number of digits in the barcode, press F1. To decrease the number of digits in the barcode, press F2. To proceed, press enter, or to return to the Barcode Entry screen, press F3.
Set Barcode: xxxxxxx Esc Set	If enter was pressed, the user can now set the barcode that will begin the sequence. Key in a barcode and press enter to continue, or F3 to return the Barcode Entry screen.
Use Leading Zeros Enable Disable	If enter was pressed, the user can specify whether or not to use leading zeros in the auto generated barcode, for example: If the user selected 7 digits in the barcode and entered 1000 as the barcode, the barcode will be 0001000 if leading zeros are enabled. To enable leading zeros press F3, to disable, press enter. The current barcode that will be generated is displayed in the bottom left hand corner of the Barcode Entry screen.
Site x New Barcode 0001000 5000	The current barcode that will be generated is displayed in the bottom left hand corner of the Barcode Entry screen.

Entering Items

-

Screen	Instruction
Site x New Barcode 0000000 5000	Type in the new barcode or press F3 quickly to choose the auto generate number. Once a barcode has been specified, items can be entered. If the screen displays "search barcode" press enter to switch to new barcode. There must be no numbers entered in to switch between the two modes.
Loc | Desc | Make	A selection of details can be entered for an item. Details include; location, description, make, model, serial number, serial number, asset number, frequency of test and notes. Each heading relates to an 'F'; eg Loc = F1, Desc = F2 and Make = F3. Only 3 items are displayed at one time. To scroll through the various details, press enter key. By continually pressing enter you can loop back to the first 3 items. **Please make sure** location, description are filled out and check to see that the frequency is correct. Once the details are entered **hold** the enter key for 2 seconds to move on to the visual check screen.
Location ALP	Entering an item details is the same process as entering sites and users, please refer to the Adding a Site/User steps above. Ensure that test frequency for the item is set in accordance with the AS/NZ 3760 Standard
Visual Check xx/xx/xxxx xx:xx Out of Services Fail Pass	After the item has been visually inspected, there is 1 of 3 options that can be selected; Out of Service (F2), Fail (F3) and Pass (enter). If Out of Service or Fail is selected the result will be saved and the TnT will revert back to the barcode entry screen. If you have a zebra printer a tag will be printed. If the test is a visual check only then press (enter hold). See below for details.

Main Menu A Earthed Test D/Insulated Test Ext Lead Test	If the item passes a visual inspection and pass is selected, testing can begin. Select the correct test based on the appliance type.
Test Results Earthbond Pass Insulation Pass	Once test has completed the results are displayed.
What Next? Re-Test Cont.	To test the item multiple times press (F3) this will take you back to the main menu A screen. From here you can choose a test class. You would use this for example if testing power boards. To complete the test press (enter). This will take you back to the new barcode screen. If you have a zebra printer a barcode will be printed once (enter) is pressed.
Visual Check Only Option	
Visual Check xx/xx/xxxx xx:xx Out of Services Fail Pass	Items can be passed with a visual check only (no testing required). You must be at the visual check screen shown on the left. To do a visual check only press and hold (enter) for 2 seconds.
Visual Check Only? Save and Exit Yes No	Pressing (enter) will take you back to the visual check screen. Pressing (F3) will complete the test. Print out a tag if you have a zebra printer. Then go back to the new barcode screen.

Retesting Equipment

The following must be done before retesting:

- A site must exist in the tester with records. A site is usually uploaded from WinPATS.
- The correct site must be displayed on the first line of the new / search barcode screen. If the incorrect site is displayed no equipment will be reported when scanned. To change see the add sites section.
- The correct user must be selected from the users list. A user is important because it give a reference to the test results in WinPATS. It is also the user that is displayed on the tag. If there is no users create a users as described in the add equipment section or upload the users list from WinPATS.

Screen	**Instruction**
Site x Search Barcode 0000000 5000	Type in or scan the barcode number to be searched and press enter. If the screen displays new barcode press enter to switch over. The screen can only be switched if there is no numbered entered in.
Loc | Desc | Make	The existing details will be shown about the record. Any changes made here will be updated once the site is downloaded in WinPATS. If nothing needs changing hold the enter key to proceed to the next screen.
Visual Check xx/xx/xxxx xx:xx Out of Services Fail Pass	After all item details have been entered, hold the enter key for 2 seconds to proceed to the Visual Check screen. After the item has been visually inspected, there is 1 of 3 options that can be selected; Out of Service (F2), Fail (F3) and Pass (enter). If Out of Services or Fail is selected the result will be saved and the TnT will revert back to the barcode entry screen. If you have a zebra printer a tag will be printed. If the test is a visual check only then press (enter hold). See add equipment for details.
Main Menu A Earthed Test D/Insulated Test Ext Lead Test	If the item passes a visual inspection and pass is selected, testing can begin.
Test Results Earthbond Pass Insulation Pass	Once test has completed the results are displayed.
What Next? Re-Test Cont.	To test the item multiple times press (F3) this will take you back to the main menu A screen. From here you can choose a test class. You would use this for example if testing power boards. To complete the test press (enter). This will take you back to the search barcode screen. If you have a zebra printer a barcode will be printed once (enter) is pressed.

To download records using WinPATS MX software, please refer to the Downloading Records section of the WinPATS manual

Deleting Equipment

If for some reason a record needs to be deleted it can be removed from the search barcode screen. This feature removes the whole record and not just the test results. If a record is deleted and replaced it might create a new record when downloaded in WinPATS. This is because the record details didn't match the original ones. Multiple items cannot be deleted at the same time.

Site x Search Barcode 0000435 4535	From the search barcode screen press and **hold** the enter key. Then press the F1 key. The feature cannot be selected when new barcode is displayed.
Site x S/Record Del. 0000435 4535	The search barcode will change to S/Record Del. Scan or type the barcode that needs to be deleted. If the record does not exist or is in the wrong site a message will be displayed saying nothing was found.
Delete Record? [barcode] Hold F3 to Delete Delete Quit	When a match is found a last warning message will be displayed. To delete the record hold the F3 key for 2 seconds. To cancel press enter.

Test & Print (T&P)

T&P

The TnT product range now comes with an optional Test and Print (T&P) feature which allows the Zebra TLP 2844-Z or 2824 to be connected directly to the unit to enable printing of barcodes without the need for a PC.

This should not be confused with the TnT Memory unit. The Test and print unit has the printable functionality without the ability to store records

The TnT+ allows a single User and Site to be active at any one time. The User and Site name will appear on the barcode when printed. The User and Sites fields allow up to 7 characters to be entered, these characters include:

abcdefghijklmnopqrstuvwxyz
{|}~!“# $ %&’( )*+,-./:;<=>?@[\]^_`
0123456789
ABCDEFGHIJKLMNOPQRSTUVWXYZ

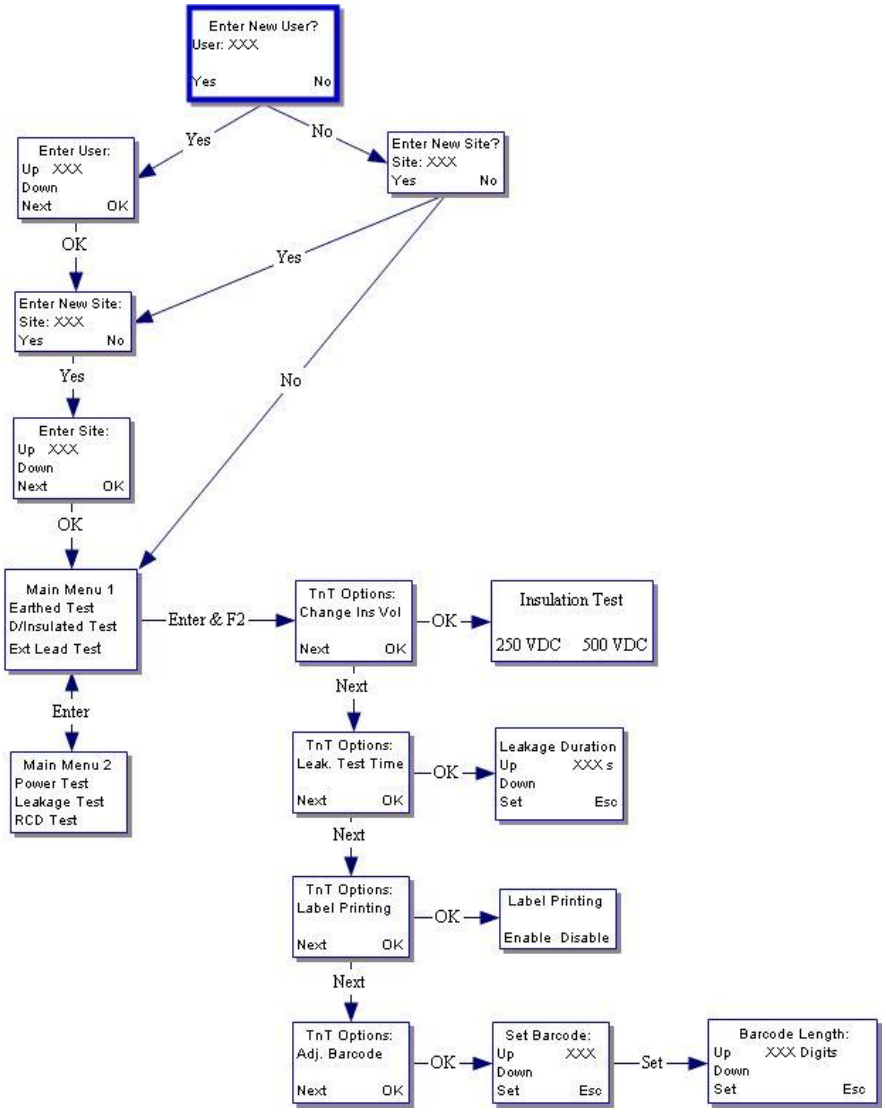
Characters can be selected by using the F1 and F2 keys, and set by using the F3 key.

Barcodes range from 0 – 999999, and can vary from 3 – 8 digits in length.

Barcodes can be selected by using the F1 and F2 keys, and set by using the F3 key.

If the printing feature is disabled, the TnT+ will boot to the Main Menu 1.

T&P Flow Chart



Options Menu

TnT Options

Here you can adjust the way the TnT behaves under certain tests and other TnT functions. Some TnT options are not available to some TnT models. Some options are only available to TnT memory units.

To access the TnT options menu:

- From either the Enter barcode screen (memory unit) or the main menu A screen hold down the return button  .
- With this button held down press the F2 key 

You should now be in the TnT options screen. The screen displays 1 option at a time.

- You can select this option by pressing the return button  .
- To select the next item press the F2 button  .
- Pressing the F3 button  escapes out of the TnT options menu.

If you have a TnT+ M model TnT your menu items will cycle as listed.

- Change Insulation Voltage
- Leakage Test Time
- Audio Option
- Label Options
- Barcode Options

Change Insulation Voltage - All TnT models

Some DUT contain MOV's (metal oxide varistor) or commonly know as spike protection devices. These limit the mains voltage to about 280VAC. If you attempt to perform a 500VDC insulation test on one of these devices you will get a failed result. To fix this problem select the 250V option.

- Press the  key to select the 250V option.
- Press the  key to select 500V option.

You can also set the unit back to 500V by switching the mains power off and on again. The default insulation voltage is 500V.

Leakage Test Time - Only El, Plus & 3PL models

The leakage test time set the run time for the leakage and power test. You may need use this feature if the DUT has a long power up time or requires special power on procedure. If the TnT leakage test time has never been altered it will use a test time of 20 seconds. From this menu you can change the test time from 5 seconds to 28800 seconds. Adjusting the test time to less than 5 seconds will put the test time to infinite.

- Press the  key to increase the test time.
- Press the  key to decrease the time.
- Press the  key to set the new leakage / power test time.
- Press the  key to escape out of the menu. No changes saved.

Audio Option - All TnT models

Enabling the audio option will make the TnT use a sound to indicate a pass or a fail at the end of a test. If the TnT unit has never been altered then the audio beep is disabled.

- Press the 

key to disable.
- Press the 
key to enable.

Label Options - Only El Memory & Plus Memory Models

Changing the label options changes the way the printer behaves or how the tag is printed. When selecting this option you will be prompted with 3 different options. Enable / Disable, Choosing a label set and modify the due date.

Enable / Disable:
Selecting this option will enable or disable the tag information being sent to the zebra printer. The printer can also be disabled by switching the printer off from the power switch located on the side of the printer. Once the printer is switched back on it will not print out the records that were created while the printer was switched off.

- Press the 

key to disable.
- Press the 
key to enable.

Choose Label Set:
If you have multiple printer tag logos stored in the printer (meaning different company logos) this function will allow you change this. If you have one logo stored in the printer then you only need to choose Label0. If you choose anything else a blank tag will be created. If you have multiple logos then the next one to choose would be label1 and so on. If you are unsure which one to choose select the Label0.

- Read the onscreen message and then press the 
key.
- Press the 

key to increase the label number.
- Press the 

key to decrease the label number.
- Press the 
key to select the displayed label number

Custom Next Test Due Dates:
Enabling this feature will allow custom next test due dates when testing equipment. When this feature is disabled (default setting) the next test due date is determined by the test date plus the frequency of test. When enable a custom date can be set after visual test in the memory TnT units.

- Press the 

key to enable.
- Press the 
key to disable.

Stop Labels Spooling On Power On:
If the printer is spooling tags on power on then it has reverted back to the factory default settings. To stop this choose the F3 key when prompted. The printer must be switched on and have a solid green light. If not, the printer won't receive the command.

- Press the 

key to enable.
- Press the 
key to disable.

Barcode Options - Only EI, Plus & 3PL Memory Models

Barcode options refers to modifying the auto generate barcode function. The barcode options can be selected by two ways. Either holding F3 down when on the new barcode screen or by the TnT options menu. Both have the same menu options expect when entering barcode options VIA TnT options. These menu options are:

- Set the number of digit for barcodes.
- Set the auto generate barcode number
- Use leading zeros for the auto generate number.
- Search all sites on barcode search (only available from TnT options menu).

Search All Sites:
Allows the TnT to search all sites listed in the site names for the given barcode. If this option has not been altered then by default search all site is disabled. When disabled the TnT can only search for barcodes that are in the site selected (Indicated by the site name in new barcode / search barcode screen).

Search all sites is useful disabled and enabled. For example, you may have many items with the same barcode number in different sites. Disabling this feature allow you isolate a particular barcode with ease. If you have a barcode but you are unsure which site it is in then you should enable search all sites.

Be careful when search all sites is enabled. If a barcode is found in another site the site name will change when you return the new barcode screen.

Other Features

Barcode Printing Function - *Only EI, Plus & 3PL Memory Models*:
This utility will print out barcode labels from what is typed on the screen. The idea is to save time by storing these barcodes in a book or collection. From here you can quickly scan a barcode without having to retype the text back into the TnT unit. To access this feature:

- Hold the 

key from the new barcode / search barcode screen.

You will be required to select your printer model. The 2844Z printer has a different print orientation to the 2824Z model. Selecting the wrong printer model will make the tag print incorrectly.

- Press the 

key if you have a 2824Z or plus model printer.
- Press the 

key if you have a 2844Z model printer.

Type the text you want for your barcode. If you go passed the end of the screen the text will wrap around. A maximum of 32 characters can be entered.

- Press the 

key to print the barcode.
- Press the 
key to return back to the new barcode screen.

Optional Accessories

WinPATS LITE Software	Part No: WCM-WinPATS Lite
WinPATS Base Software	Part No: WCM-WinPATS Base
WinPATS Base Software Upgrade	Part No: WCM-WinPATUP (dependant on specific upgrade)
Symbol Barcode Scanner	Part No: WCM-1200 Scanner USB
500mm Earth Strap	Part No: TnT-ES 500
ZEBRA Tag Printer	Part No: WCM-Z2824
3-Phase Adaptor 20A	Part No: WCM-3Phase-20A
3-Phase Adaptor 40A	Part No: WCM-3Phase-40A
3-Phase Adaptor Multi	Part No: WCM-3Phase-M
HBC Fuse	Part No: WCM-HBC10AM205
Isolation Transformer for RCD testing	Part No: WCM-ISOT

Specifications

Appliance Tester Specifications (TnT, TnT-el & TnT+ models)

Lead continuity and Polarity test @ 240VAC
Circuit continuity test 240VAC @ 2mA (appliance sense)
15A DUT Socket for Appliance testing only (Not Load Testing)

Insulation:

- Voltage: 500V DC ± < 5%, @ > 1M Ohm.
  250V DC ± < 5%, @ > 1M Ohm.
- Range 0 – 10.0M Ohms, ± < 5% of reading @ 1M Ohm.
- Pass Limit > 1M Ohms

Earth Bond:

- Current 200mA DC
- Range 0 – 10.0 Ohms ± < 5% of reading @ 1 Ohm.
- Pass Limit < 1.0 Ohms

Leakage Tester (for TnT-el & TnT+ models only)

Earth Leakage:

- 240VAC supply mA
- Range 0 – 30.0mA ± < 5% of reading
- Pass limit – dependent on test requirements
- Load current max 10A resistive
- HBC fuse protected 500Vac 10A (M205)
- (X-Models Only 20A, Thermal overload protected manual reset)

Power Test (for TnT+ model only)

- Voltage 220 – 270 VAC ± < 5% of reading
- Current 0 -10 A ± < 5% of reading (X-Models Only, 0 – 20A)
- Load current max 10A resistive
- HBC fuse protected 500Vac
- (X-Models Only 20A, Thermal overload protected manual reset

RCD Test (for TnT+ model only)

- Trip Current 2 – 500mA ± < 5% of value
- Trip Time 0 – 300 mS ± < 1mS
- Battery powered when testing RCD

Display (for TnT, TnT-el & TnT+ models)

- Backlit Graphics. 64 x 128 LCD PVC protected (Blue White) 40 x 70mm

Mechanical (for TnT, TnT-el & TnT+ models)

- Case ABS plastic
- Size: 200L x 175W x 70D
- Weight: 1.5Kg (X-Models Only, 2.5Kg)

Safety (for TnT, TnT-el & TnT+ models)

The instrument in general meets the requirements of relevant

- IEC, AS & CE.
- Safety Class II (Double insulated)
- CAT III 600V
- DUT Test Fuse Protected at 10A, only use HBC fuses, warranty void if not used
- Tester Fuse Protected. 1A Non user serviceable

Relevant Authorities

WorkCover NSW GPO Box 5364 Sydney NSW 2001-0423 Australia Ph: 02 4321 5000	Dept. of Fair Trading – NSW Safety and Standards Branch P O Box 972 Parramatta NSW 2124 Australia Ph: 02 9895 0111
	Dept. of Mines and Energy QLD Electrical Safety Office PO Box 69 Brisbane QLD 4001 Australia Ph: 07 3237 1201
	Electrical Standards and Safety – Tasmania P O Box 56 Rosney TAS 7018 Australia Ph: 03 6233 7831
	Office of the Chief Electrical Inspector Ministry of Commerce, New Zealand Energy and Resources Division P O Box 1473 New Zealand 6015 Wellington
	Office of Energy WA Technical and Safety Division 20 Southport Street West Leederville WA 6007 Australia Ph: 08 9420 5600
	Office of the Chief Electrical Inspector – VIC P O Box 262 Collins St. West Melbourne VIC 8007 Australia Ph: 03 9203 9700
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